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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,838	08/05/2004	SOLOMON ZAROMB		4837

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EXAMINER	
RAMDHANIE, BOBBY	

ART UNIT	PAPER NUMBER
1797	

NOTIFICATION DATE	DELIVERY MODE
07/09/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Office Action Summary	Application No.	Applicant(s)	
	10/710,838	ZAROMB ET AL.	
	Examiner	Art Unit	
	BOBBY RAMDHANIE	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 03/21/2008 have been fully considered but they are not persuasive. The following reasons are why:

2. Applicants' argue that Bentley et al does not disclose an electrostatic precipitator. Examiner respectfully disagrees. Figure 3 of the Bentley et al reference discloses the electrostatic precipitator.

3. Applicants' also argue that what the applicants believe are "cryptic wordings" suggesting an electrostatic precipitator does not in any way imply a tubular collector electrode or the "co-axial spiked wire or rod-shaped discharge electrode." Examiner respectfully disagrees. It has been held (at least since the year of 1960) that an electrostatic precipitator generally consists of a hollow cylindrical outer electrode surrounding an axially positioned center electrode such as a wire (rod) to which high negative potential is supplied whereby corona discharge around the central electrode causes charging of the solid particles of the flow in the cylinder. Evidence of this fact may be found in Grindell (US2932966); See Column 1 lines 39-46.

4. Applicants further argue intended use as to how the ultrasonic transducer is used. Applicants' argue that the ultrasonic transducer of Bentley et al does not supply a mist to the electrostatic transducer. Examiner respectfully disagrees because Bentley et al clearly shows this happening by a continuous flow of the mist from the areas labeled in Figure 3 and Item 3, out through opening Item 19 and into the electrostatic precipitator (See Bentley et al Column 2 lines 46-51). Bentley et al further states a mist

enters the electrostatic precipitator (See Column 3 lines 33-35), which would indicate that a mist is still contained in the stream as it enters the electrostatic precipitator).

5. Applicants' argue that Bentley et al does not disclose submicron particles such as viruses. Examiner respectfully disagrees. Bentley et al discloses micro-organisms (See Column 1 lines 32-34). In the art of aerosol collectors, such as electrostatic precipitators, micro-organisms encompass submicron size organisms. Evidence of this fact may be found in Tally (US5855652), in which he clearly states examples of micro-organisms such as viruses and bacteria (See Abstract). As a general fact in the art of electrostatic precipitators, micro-organisms inherently include submicron size particles such as viruses as well as others which are on the sub-micron size scale. Further, gases such as sulfur oxides are also on the sub-micron size scale (See Bentley et al Column 1 lines 24-26).

Response to Amendment

Claim Objections

6. Claims 15-19 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 15-19 are dependent on Claim 1. Claims 15-19, do not add any structural limitations which further define the structure of the improvement in the apparatus of Claim 1. Claims 15-19 instead attempt to further limit the base claim by how the device is operated, not by adding additional structural limitations to further define the device.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3, 5-7, 9 & 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Bentley et al (US5085673).

Applicants' claims are toward a device.

Regarding Claims 1-3, 5-7, 9 &12-14, Bentley et al discloses in apparatus for detecting the presence of an airborne chemical or biological analyte, the improvement comprising: A). A gas-and liquid-containing chamber (See Figure 3 Item 3); B). Means for introducing an analyte-free collection liquid into said chamber (See Figure 3 Item 26 or Figure 1, Liquid); C). Means for rapidly sampling a volume of ambient air and transferring said analyte therefrom into said collection liquid, said sampling means comprising an air intake means (See Figure 3 Item 25, & See Figure 1, Gas) and an air venting means (See Figure 3); and D). Means for removing from said chamber an analyte-enriched collection liquid; wherein said volume of air passes through a preferably horizontal air inlet and upwardly thence through a preferably vertical electrically conductive collector electrode tube with means for applying an electric field between said tube and a co-axial spiked wire- or rod-shaped discharge electrode (See Figure 3 Electrostatic Precipitator), wherein said electric field is high enough to

effectuate a corona discharge so as to generate ionized particles that could be driven towards said collector electrode by an electric field.

Additional Disclosures Included: Claim 2: The apparatus of claim 1, comprising means for introducing a fine mist of droplets into the air stream passing through said collector tube so as to cause wetting of the inner surface of said tube by a liquid film (See Column 1 lines 48-49 & Column 3 lines 33-35); Claim 3: The apparatus of claim 2, wherein said mist is generated by an ultrasonic humidifier (See Column 1 lines 48-49); Claim 5: In a method for detecting the presence of an airborne chemical or biological analyte, the improvement comprising the steps of providing A). A gas-and liquid-containing means (See Figure 1 & Figure 3 Item 3); B). Introducing an analyte-free collection liquid into said containing means (See Figure 1; Liquid & Figure 3 Item 26); C). Rapidly sampling a volume of ambient air and transferring said analyte therefrom into said collection liquid (See Figure 1 & Figure 3), said sampling means comprising an air intake means (See Figure 1; Gas & Figure 3 Item 25)) and an air venting means (See Figure 3; Fan); D). Removing from said containing means an analyte-enriched collection liquid (See Figure 1 Item 17 & See Figure 3 Item 17); and E). Passing said volume of air through a preferably horizontal air inlet (See Figure 1 Item 19 & Figure 3 Item 19) and thence through a preferably vertical collector electrode tube (See Figure 3 Electrostatic Precipitator); and applying an electric field between said tube and a co-axial spiked wire- or rod-shaped discharge electrode, wherein said electric field is high enough to effectuate a corona discharge so as to generate ionized particles that could be driven towards said collector electrode by an electric field. Claim 6: The method of

Claim 5, comprising the step of introducing a fine mist of droplets into the air stream passing through said collector tube so as to cause wetting of the inner surface of said tube by a liquid film (See Summary of Invention & Column 3 lines 33-35); Claim 7: The improvement of claim 6, wherein said mist is generated ultrasonically (See Column 1 lines 48-49); Claim 9: The apparatus of claim 1, wherein said collector electrode is a tube_with its inner surface electrically conducting (See Column 3 lines 33-35; the collector electrode is inherently metallic); Claim 12: Bentley et al discloses the method of capturing aerosolized sub4niaran-sizv-patticle.s as small as 0.01 micron in size from a volume of air which comprises passing said air through an electrostatic precipitation-based aerosol collector (See Summary of Invention lines 23-36 and Column 2 lines 10-17); Claim 13: Wherein said submicron-sized particles are virus particles (See Summary of Invention, Column 1 lines 33-36); Claim 14: Wherein said particles are toxin particles (See Column 1 lines 29-36)

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 15, 16, 18, 19, & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bentley et al in view of Grindell (US2932966).

12. Applicants' claims are toward a device.

13. Regarding Claim 15, Bentley et al discloses the apparatus of claim 1, wherein said collector electrode is tube-shaped with its inner surface electrically conducting, said central wire-or rod-shaped discharge electrode and said horizontal tubular air intake permits air to enter unimpeded at a high flow rate with a minimal pressure drop. Bentley et al does not disclose that the central wire-or rod-shaped discharge electrode is kept at a high negative or positive potential, possibly of as much 10 KV or higher. Grindell discloses an improvement in an apparatus for smoke detection which details an electrostatic precipitator in which the central wire-or rod-shaped discharge electrode is kept at a high negative or positive potential, possibly of as much 10 KV or higher (See Column 2 lines 68-70). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the same electrostatic precipitator with a high negative or positive potential, possibly of as much 10 KV or higher since both Grindell and Bentley et al disclose that the improvement is used for detecting smoke particulates from a gas/mist stream from chimneys, ducts, or smoke stacks.

14. For Claim 16, Bentley et al discloses the apparatus of claim 2, except wherein said liquid film is at least 25 microns thick, so as to minimize collection losses due to captured particles adhering too firmly to the collector electrode. Bentley et al does

disclose that the droplets are collected in the electrostatic precipitator where the droplets (which essentially form a film) are substantially removed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the voltage at which the electrode in the electrostatic precipitator was held at, since it has been held that the provision of adjustability, where needed, involves routine skill in the art. In re Stevens, *101 USPQ 284 (CCPA* 1954).

15. For Claim 18, Bentley et al in combination with Grindell disclose the apparatus of claim 16, except wherein explicitly disclosing the thickness of said liquid film is fine-tuned by adjustments of the power of the exhaust air blower and of the inter-electrode voltage and electric field distribution such as to assure that the introduced mist results in proper wetting of the collector electrode without causing unwanted spark discharges. Grindell however discloses screening one of the electrodes from the other to avoid corona effects as well as adjusting the voltage accordingly. It would have been obvious to one of ordinary skill in the art to recognize that a mist made up of an aqueous solution, which is highly conductive would affect the electric field and unwanted corona effects due to the thickness film building up. As a result, one of ordinary skill in the art would be able to fine-tune by adjustments of the power of the exhaust air blower and of the inter-electrode voltage and electric field distribution such as to assure that the introduced mist results in proper wetting of the collector electrode without causing unwanted spark discharges to obtain the maximum amount of effluent to be removed from the gas before allowing the gas to be returns to the atmosphere.

16. For Claim 19, Bentley et al discloses the apparatus of claim 1, except wherein the electrodes and applied voltage are so designed and adjusted as to generate a sufficient corona to ionize most of the particles in the air stream and a sufficient electric field to deposit most of these particles at the collector electrode, and wherein the length and diameter of said collector electrode are such as to allow an adequate residence time for most particles to reach it rather than be carried away with the air stream. Grindell discloses the electrostatic precipitator wherein the electrodes and applied voltage are so designed and adjusted as to generate a sufficient corona to ionize most of the particles in the air stream and a sufficient electric field to deposit most of these particles at the collector electrode, and wherein the length and diameter of said collector electrode are such as to allow an adequate residence time for most particles to reach it rather than be carried away with the air stream (See Column 1 lines 39-54 & Figure 1 Items 14 & 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Bentley et al with Grindell because according to Grindell, not all of the particulates are attracted to the collector electrode, which would indicate a different polarity of charge is needed to attract those particulates to the collector electrode or a higher potential voltage may be required.

17. Claims 4, 8, & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bentley et al in view of Liu et al (US6221136). Regarding Claim 4, Bentley et al discloses the apparatus of claim 2, except for comprising a means for generating and transmitting ultrasonic waves across the interface between said tube and said liquid film so as to help transfer particles or biological cells adhering to the tube surface from said

surface into said film. Liu et al discloses an electrostatic precipitator which comprises an ultrasonic droplet generator which is used to pick up droplets in the space above an agitated liquid produced by ultrasonic agitation using an ultrasonic transducer. The dry particulate matter will be precipitated along with the added liquid droplets in the precipitator and be carried away by the liquid stream resulting from the collected droplets, thereby preventing the build up of dry solid material on the collecting electrode in the precipitator (See Column 10 lines 13-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Bentley et al with an ultrasonic transducer in conjunction with the electrostatic precipitator to remove the solid particulate from accumulating on the collector electrode because the build up on the electrodes would act as an insulator layer and therefore require a higher voltage to attract more particulates out of the mist/gas stream as time goes on.

18. For Claim 8, Bentley et al discloses the method of Claim 6, except for comprising the step of generating and transmitting ultrasonic waves across the interface between said tube and said liquid film so as to help transfer particles or biological cells adhering to the tube surface from said surface into said film. Liu et al discloses an electrostatic precipitator which comprises an ultrasonic droplet generator which is used to pick up droplets in the space above an agitated liquid produced by ultrasonic agitation using an ultrasonic transducer. The dry particulate matter will be precipitated along with the added liquid droplets in the precipitator and be carried away by the liquid stream resulting from the collected droplets, thereby preventing the build up of dry solid material on the collecting electrode in the precipitator (See Column 10 lines 13-32). It

would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Bentley et al with an ultrasonic transducer in conjunction with the electrostatic precipitator to remove the solid particulate from accumulating on the collector electrode because the build up on the electrodes would act as an insulator layer and therefore require a higher voltage to attract more particulates out of the mist/gas stream as time goes on.

19. For Claim 20, the combination of Bentley et al and Liu et al disclose the apparatus of claim 4, comprising means for operating the system in alternating dry and wet modes so as to cut down on evaporation losses during operation in the dry mode and thus reduce the water replenishment requirements and to also limit the occurrence of any power losses due to spark discharges to relatively brief wet wash-down periods (See Column 10 lines 13-32).

20. Claims 10 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bentley et al in view of Thomas et al (US2916626). Regarding Claim 10, Bentley et al teaches the apparatus of Claim 1. Bentley et al does not teach that said collector electrode comprises an electrically conductive coating or foil applied to the inner surface of a non-conductive tube. Thomas teaches the feature of said electrode comprises an electrically conductive coating or foil (Column 1 lines 42-48). Thomas does not explicitly teach the tube is made of a nonconductive material. It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the combination of Bentley et al and Thomas with a non-conductive material tube because the amount of

current within the space encased by the aluminum foil in the tube ranges between 12 to 15,000 volts.

21. For Claim 11, Bentley et al teaches the apparatus of claim 9. Bentley does not teach that the collector electrode has a roughened preferably sandblasted inner surface. Thomas teaches the use of electrostatic precipitator which can be used to precipitate radioactive particles from an air sample (Column 1 lines 44-48). Thomas does not teach the use of sandblasting to roughen the inner surface. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the collector electrode by the use of sandblasting because when dealing with radioactive samples adhering to metal surfaces, chemical cleaning agents do not physically remove all of the radioactive substances from the electrode surface. A more physical rigid approach such as sandblasting the metal surface aids in the removal of the radioactive substance for reuse of the electrode with a new gas/air sample.

22. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bentley et al in view of Grindell and in further view of Thomas (US2916626).

23. Applicants claim is toward a device.

24. Regarding Claim 17, the combination of Bentley and Grindell disclose the apparatus of claim 16, wherein said liquid film is formed by dripping liquid from the top down and/or by liquid droplets that are carried by the sampled air. This combination does not disclose that the collector electrode possesses a roughened, preferably sandblasted, metal surface. Thomas teaches the use of electrostatic precipitator which can be used to precipitate radioactive particles from an air sample (Column 1 lines 44-

48). Thomas does not teach the use of sandblasting to roughen the inner surface. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the collector electrode by the use of sandblasting because when dealing with radioactive samples adhering to metal surfaces, chemical cleaning agents do not physically remove all of the radioactive substances from the electrode surface. A more physical rigid approach such as sandblasting the metal surface aids in the removal of the radioactive substance for reuse of the electrode with a new gas/air sample.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious ove, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-15 & 19 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 & 7-11 of

copending Application No. 11/473748. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

3. Claims 1-15 & 19 of the instant application recite a “chamber” and the copending application teaches the chamber to be a “container.’

4. Claims 1-15 & 19 of the instant application recite a "volume of ambient air" and copending application teaches this volume to be "ambient air."

5. Claims 1-15 & 19 of the instant application recites "preferably" and copending application teaches this to be "substantial."

6. Claims 1-15 & 19 of the instant application recites a “fine mist of droplets” and copending application teaches this “fine mist of droplets” to be an “injection of water sprays.”

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Telephonic Inquiries

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BOBBY RAMDHANIE whose telephone number is (571)270-3240. The examiner can normally be reached on Mon-Fri 8-5 (Alt Fri off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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